November 17, 1990
R-6570-STK-4129

URE-40 DIESEL INCIDENT AT THE 10-52 BOILERHOUSE

This tank is one of three tanks that each have a capacity of 25,000 gallons and typically contains about 20,000 gallons of Diesel fuel as a standby source of fuel in the event of an interruption of the Natural Gas supply. The steam generated by the boilers is used for building heat and thereby exempts these tanks from Federal regulation. These tanks are, however, subject to Renton Ordinance 4147.

On the morning of November 9, 1990, the L&J Leak Detection Monitor Leak Test indicated a "leak" of 0.4 gallons per hour (gph), although there was no level change in the tank. This is not unusual, because the software in the monitor measures the tank volume and temperature, then calculates product gallonage at 60 F. The temperature probe is only sensitive to 0.2 F and any temperature increase over the course of the leak test will indicate a "leak". Conversely, the leak test will indicate an "accumulation" for a temperature decrease. These "leaks" and "accumulations" can be attributed to tank expansion with the temperature change. This "leak" of November 9, 1990 was based upon a temperature change, not a volume change, and therefore can be discounted.

On Monday, November 12, the Boiler Room Operator measured the tank level with a dip stick at the Sounding Pipe and compared the level with that of the monitor. There was a level difference between the two measurements, the oil running off of the dip stick looked to be of poor quality and full of water. Since the Inventory Report from the Leak Detection Monitor showed only 1 inch of water, he notified Steve Karich of the situation, who then brought a sampling device (baler) to the tank and to sample the oil. The samples were taken at the Sounding Pipe, the only easy access to the tank other than the manhole. At two feet off the bottom of the tank, the sample was essentially water that appeared to have settled in the bottom of the tank. It had more clarity than ground water, but was clearly water. At 4 feet off of the bottom of the tank, the sample was again essentially water. At 6 feet off of the bottom of the tank, it appeared to be mostly oil that was emulsified with water. The sample of the bottom, which was essentially water, was discarded and a surface sample was taken for a Flash Point determination, which is required by Chemical Processors in order to pick up the material in the tank. Clearly, something was amiss, so Steve Karich called WDoE and the City of Renton and indicated that there was an apparent loss of 10,000 gallons of Diesel fuel. Chem Pro was contracted to remove the product on Wednesday.

On Wednesday, November 14, the manhole was removed from the tank and two loads were removed from the top of the tank. The level of product in the tank as measured at the manhole was 102 inches, which is about 22,800 gallons. The Sounding Pipe level indicated 86 inches

or about 19,400. Samples of the product from the manhole were completely different from those of the Sounding Pipe: the product appeared to be of good quality. Two Boeing Fire Department officials (Larry Johnson and Larry Strong) as well as Jim Gray of the City of Renton observed the clear product samples from the tank via the manhole and the rag oil samples taken from the Sounding Pipe. Upon emptying the tank, there appeared to be approximately 7 inches of sludge remaining (as measured at the manhole) and 13 inches showing in the Sounding Pipe. The Sounding Pipe is not providing an accurate picture of the level and quality of oil in the tank.

On Thursday, November 15, 1990, Chem Pro provided a man to enter the tank in supplied, fresh air equipment. He measured the Sounding Pipe to be 7 inches from the bottom of the tank and 4 feet from the north end of the tank. The Stain Line in the tank provides the best reference for slope determination. The Stain line at the north end of the tank is 8 feet 10 inches from the bottom and 7 feet 3 inches on the south end. This indicates a 4% slope in the tank.

CONCLUSIONS

The unexpected slope of the tank is probably due to settlement of the building and accounts for the presence of water in the Sounding Pipe and only 1 inch indicated on the monitor. The big mystery of the situation was how the water level could be more than four feet in the Sounding Pipe and only 1 inch at the probe. This can be described as a simple U tube manometer problem with two fluids of different densities. The water in the tank settled out of the oil and wound up at the low end, above the bottom of the Sounding Pipe. As the Boiler Operators stick the tank, oil adheres to the dip stick and is thereby removed from the Sounding Pipe. The water in the tank is then wicked up the Sounding Pipe to maintain the equilibrium between the tank and the Sounding Pipe. Removing oil samples from the Sounding Pipe, as was done by Steve Karich, would have the same effect. The water has a higher specific gravity than that of oil, so the Sounding Pipe would then have a lower level than that of a column of the oil, which accounts for the discrepancy noted by the Boiler Operator between the Sounding Pipe and the Monitor. The final question is that of the integrity of the tank. The Leak Detection Monitor conducted three Leak Tests after the "leak" reported November 9, 1990 and the tank passed each one (the temperature remained constant). There is no indication of a leak and fuel could be returned to the tank.

AGREEMENT

On Thursday, November 15, 1990, a meeting was held at the City of Renton Fire Prevention Bureau offices to discuss the situation. In attendance from the Renton Division of BCAG were Steve Karich and Jenette Ramos. Jim Gray, Glen Gordon and Camille Walls represented the FPB and Gary Gordon, a former employee of the FPB and currently with Boeing SHEA, was there. The above conclusions were understood and all were in agreement. The City requested that the tank be:

temporarily out of service,
cleaned and inspected,
filled with product and tested.

Steve Karich agreed to comply with this request and will use the Petrotite test procedure. It is the procedure with which the FPB is most familiar. The estimated date of completion is December 21, 1990. The results of the testing will be provided to the Washington Department of Ecology and the City of Renton as soon as they become available.

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